

REPORT
ON
HABITAT INNOVATION CONCLAVE 2023

Submitted By

Prof. Bim Prasad Shrestha, PhD, Convener for Innovative Habitat Conclave-2023
Organizing Team Member of Energy Efficient Building Design Graduate Students
**Ms. Sunita Koju, Mr. Sharthak Niroula, Mr. Sanjaya Rajbanshi and Mr. Nimesh Lal
Shrestha**

March 2023

ACKNOWLEDGEMENT

The Habitat Innovation Conclave 2023 held on March 16-17, 2023, would not have been possible without the support and contributions of several individuals and organizations. Therefore, we would like to express our gratitude to all those who have helped make this event a success.

Firstly, we would like to acknowledge the keynote speakers and panelists who shared their insights and expertise with us. Their presentations and discussions provided valuable insights and actionable ideas that will be useful in advancing sustainable development efforts worldwide. We would also like to thank the sponsors and partners who supported us in organizing this event. Their generous contributions made it possible for us to bring together a diverse group of participants and speakers from around the world.

We are also grateful to the organizing committee, volunteers, and support staff who worked tirelessly behind the scenes to ensure the smooth running of the event. Their dedication and hard work were instrumental in making the Habitat Innovation Conclave 2023 a memorable and successful event.

Lastly, we would like to express our appreciation to all the participants who attended the event and contributed to the discussions and dialogue. Your presence and participation have helped make this event a rich and informative experience.

In conclusion, we would like to extend our heartfelt thanks to everyone who has contributed to the Habitat Innovation Conclave 2023. We hope that the ideas and strategies generated during the event will inspire concrete actions and positive change in the coming years.

TABLE OF CONTENTS

ACKNOWLEDGEMENT	ii
TABLE OF CONTENTS.....	iii
LIST OF FIGURES	iv
SECTION 1: INTRODUCTION.....	1
1.1 Introduction	1
1.2 Background.....	1
1.3 Objectives	2
1.4 Importance of Conclave.....	3
1.5 Aim of Habitat Innovation Conclave 2023.....	4
SECTION 2: METHODOLOGY	5
2.1 Participants	6
2.2 Conclave Delegates	7
SECTION 3: DAY WISE ACTIVITIES	9
3.1 First Day: 16th March 2023.....	9
3.2 Second Day: 17th March 2023	15
SECTION 4: CLOSING SESSION	29
SECTION 5: ACHIEVEMENT AND OUTCOMES	30
SECTION 6: CHALENGES AND WAY FORWARD	32
SECTION 7: CONCLUSION AND RECOMMENDATIONS.....	33
SECTION 8: FEEDBACK FROM PARTICIPA.....	34
SECTION 9: ANNEX.....	35
Conclave Schedule.....	35
Some Glimpse of the Program.....	40

LIST OF FIGURES

Fig: 1 Welcome remarks by Prof. Dr. Bim Prasad Shrestha	40
Fig: 2 Remarks by Chief Guest Dr. Padma Bahadur Shahi and Keynote speech by Prof. Dr. Sangeeta Singh.....	40
Fig: 3: Closing Remarks by Er. Ganesh Shah.....	41
Fig: 4 Press Meet of HIC 2023	41
Fig: 5 Panel Discussion with the Advisors and AEPC member	42
Fig: 6 : Vishal Plastocab showcasing their products and Heritage Nepal showcasing their indoor, outdoor and pool lighting products	43
Fig: 7 Gorkha Eco Panel showcasing their products and Asian Paints showcasing their produc	43
Fig: 8 Closing remarks by Er. Ganesh Shah	44
Fig: 9 Chief Guest, Advisors, Convenor and Participants	44
Fig: 10 Participants in the conclave	45
Fig: 11 Convener sharing Token of Love to Advisor Dr. Sunil Babu Shrestha	46

SECTION 1: INTRODUCTION

1.1 Introduction

The Habitat Innovation Conclave 2023 is a highly anticipated event that was held on 16th and 17th March 2023. The event brought together experts, professionals, and thought leaders from various sectors to discuss and explore innovative solutions for sustainable urban development.

The conclave featured a range of activities, including keynote speeches, panel discussions, workshops, and exhibitions showcasing the latest innovations and technologies in the field of sustainable urban development. Participants included industry leaders, policymakers, researchers, and other professionals, making it a valuable opportunity for networking and knowledge exchange. The event provided a space for stakeholders to collaborate, develop partnerships, and identify key challenges and opportunities in the field. The Habitat Innovation Conclave 2023 was organized by Energy Efficient building design 2021, Department of Mechanical Engineering, Kathmandu University. The event was a testament to the growing importance of sustainable urban development and the need for innovative and collaborative solutions to the challenges facing our cities. The discussions and presentations at the event provided a valuable platform for sharing best practices, case studies, and success stories from around the world.

Overall, the Habitat Innovation Conclave 2023 was an important event for anyone interested in sustainable urban development and the future of our cities. It provided a forum for exchanging ideas, knowledge, and best practices, as well as an opportunity to connect with like-minded professionals and experts in the field. The event was a valuable resource for promoting innovative and sustainable solutions to the challenges facing our cities.

1.2 Background

The Habitat Innovation Conclave 2023, held on 16 and 17 March 2023, was a critical program that aimed to promote sustainable urban development and address key challenges related to urbanization. The program focused on various thematic areas, including Innovative Building Materials, Building Codes, Policies, and Standards, Planning, Design, and Retrofitting with Emerging Technologies, Water and Sanitation, Energy Efficiency in Buildings, and Women in Engineering and Habitat. The thematic areas were carefully chosen to address challenges facing cities and promote innovative solutions for sustainable urban development.

The agenda for the conclave includes keynote speech from eminent expert, panel discussions on relevant topics, and interactive workshops aimed at engaging participants in active learning. The conclave also provided a platform for participants to showcase their research, ideas, and innovations through poster presentations.

1.3 Objectives

The following objectives were set for this conclave:

- **To promote sustainable urban development:** One of the primary objectives of the Habitat Innovation Conclave was to promote sustainable urban development by addressing key challenges related to urbanization. The program aimed to explore innovative solutions and technologies that can help make cities more sustainable, resilient, and liveable.
- **To showcase new and innovative building materials:** The Habitat Innovation Conclave aimed to showcase new and innovative building materials that can be used for construction and building. The program provided a platform for experts to showcase environmentally friendly and cost-effective materials that can help reduce waste and improve indoor air quality.
- **To explore innovative building codes, policies, and standards:** Another objective of the Habitat Innovation Conclave was to explore innovative building codes, policies, and standards that can promote sustainable urban development. The program aimed to provide a framework for ensuring that buildings are safe, energy-efficient, and environmentally sustainable.
- **To highlight the importance of energy efficiency in buildings:** The Habitat Innovation Conclave aimed to highlight the importance of energy efficiency in buildings. The program explored new technologies and innovations that can be used to make buildings more energy-efficient, reducing their carbon footprint and improving their environmental sustainability.
- **To promote gender equity and diversity in the engineering and habitat sectors:** The Habitat Innovation Conclave also aimed to promote gender equity and diversity in the engineering and habitat sectors. The program provided a platform for women

professionals to share their experiences, challenges, and successes in the industry, highlighting the importance of diversity in the field.

- **To foster collaboration and networking among industry experts:** Finally, the Habitat Innovation Conclave aimed to foster collaboration and networking among industry experts. The program provided a platform for experts from different fields to share their knowledge and expertise, promoting interdisciplinary collaboration and innovation.

1.4 Importance of Conclave

Here is the importance of Habitat innovation conclave 2023

- **Promoting sustainable urban development:** The conclave brought together experts, researchers, and policymakers to discuss innovative solutions to challenges related to urbanization. It promoted sustainable urban development by exploring new technologies and innovations that can make cities more liveable, resilient, and sustainable.
- **Addressing global challenges:** The conclave addressed some of the most pressing global challenges related to habitat and engineering. It focused on key thematic areas such as innovative building materials, building codes and policies, planning and design, energy efficiency, water and sanitation, and women in engineering and habitat. These areas are crucial for achieving sustainable development and addressing the challenges facing the planet.
- **Encouraging innovation and creativity:** The conclave provided a platform for experts to showcase their innovative ideas, products, and technologies related to habitat and engineering. It encouraged creativity and innovation by bringing together experts from different fields and encouraging them to collaborate and share ideas.
- **Sharing knowledge and expertise:** The conclave provided an opportunity for experts to share their knowledge and expertise with a wider audience. The event featured keynote speeches, panel discussions, and workshops, allowing participants to learn about the latest developments in the field and exchange ideas with their peers.
- **Promoting diversity and gender equity:** The conclave highlighted the importance of diversity and gender equity in the engineering and habitat sectors. It provided a platform for women professionals to share their experiences and challenges, promoting gender equity and diversity in the industry.

- **Fostering partnerships and collaborations:** The conclave provided an opportunity for participants to build partnerships and collaborations with other professionals and organizations. It created a space for networking and building relationships that can lead to new ideas, projects, and collaborations that can advance sustainable urban development and habitat innovation.

1.5 Aim of Habitat Innovation Conclave 2023

The aim of the Habitat Innovation Conclave held on 16 and 17 March 2023 was to bring together experts, policymakers, and practitioners from around the world to discuss innovative solutions for sustainable urban development and habitat. The conclave aimed to address some of the key challenges facing cities and habitats today and explore new technologies and innovations that can make them more livable, resilient, and sustainable.

Some of the specific aims of the conclave were:

- To explore innovative building materials and construction techniques that can make buildings more sustainable, energy-efficient, and environmentally friendly.
- To discuss building codes, policies, and standards that can promote sustainable development and ensure the safety and well-being of citizens.
- To showcase emerging technologies and tools for planning, design, and retrofitting of urban areas to make them more sustainable and resilient to climate change.
- To discuss ways of improving water and sanitation systems in urban areas to ensure access to safe and clean water and sanitation for all citizens.
- To explore innovative approaches for improving energy efficiency in buildings and reducing their carbon footprint.
- To promote gender equity and diversity in the engineering and habitat sectors and encourage the participation of women in these fields.

Overall, the aim of the Habitat Innovation Conclave was to foster innovation, creativity, and collaboration among experts and practitioners from different fields to address the challenges facing urban habitats and promote sustainable development.

SECTION 2: METHODOLOGY

The Habitat Innovation Conclave 2023, provided a platform for experts, innovators, and thought leaders to discuss new methodologies in habitat innovation. The conclave was structured around several key components, including:

- **Keynote Speech:** The conclave started with a keynote speech by a prominent expert in the field of sustainable habitat design and development. The keynote speech aimed to set the tone for the event and provide attendees with an overview of the current state of habitat innovation.
- **Speaker's Presentation:** The conclave included presentations by researchers and academics in the field of sustainable habitat design and development. The presentations covered a range of topics related to thematic areas.
- **Product Demonstration:** The conclave also included product demonstrations by companies and organizations showcasing innovative products and solutions for sustainable habitat design and development. The product demonstrations provided attendees with an opportunity to see new technologies and products in action and learn about their benefits.
- **Panel Discussion:** The conclave included panel discussions featuring experts and thought leaders discussing various topics related to sustainable habitat design and development. The panel discussions provided a platform for attendees to engage with the experts, ask questions, and learn from their experiences.
- **Case Studies:** The conclave also featured case studies of successful sustainable habitat design and development projects. The case studies provided attendees with practical examples of sustainable building design, construction, and operation in real-world scenarios.
- **Networking:** The conclave provided ample opportunities for attendees to network with each other and with the experts and innovators in the field of sustainable habitat design and development. Networking sessions were held throughout the event, providing attendees with the opportunity to forge new partnerships and collaborations.

2.1 Participants

1. Educational Institutions

Professionals and Students from various educational institutes participated in the conclave.

- Kathmandu University
- Institute of Engineering, Tribhuvan University
- Sagarmatha Engineering College
- Nepal Engineering College
- National College of Engineering
- Kantipur Engineering College
- Himalaya College of Engineering
- Tri Chandra M. Campus

2. International Participants

Different International Universities and Organizations showed the participation.

- University of Maryland, USA
- Michigan State University, USA
- Asian Institute of Technology, Thailand
- Massachusetts Institute of Technology, USA
- United States Agency for International Development (USAID)
- International Centre for Integrated Mountain Development (ICIMOD)

3. Experts from various Organization/Firms

Experts of various fields from various organizations participated in the conclave as speaker as well as a participant. Some of Participating organizations are:

- Society of Nepalese Architects (SONA)
- Federation of Contractors Association of Nepal (FCAN)
- MinErgy Pvt Ltd, Kathmandu Nepal
- Renewable Energy Confederation Nepal (RECON)
- Environment and Public Health Organisation (ENPHO)
- Nepal Engineering Council (NEC)
- VCPM
- National Academy of Science and Technology (NAST)

- GIZ Nepal
- Jaquar & Co. P. Ltd.
- Buildup Nepal
- Green Energy Technologist P. Ltd
- National Society for Earthquake Technology (NSET)
- Alternative Energy Promotion Centre (AEPC)
- LED Lighting, Heritage Nepal
- Vishal Plastocab Ind. Pvt. Ltd.
- Asian Paints
- Bath Sense
- Gorkha Eco Panel
- Micro and Mega Futurestics Pvt. Ltd
- UN Habitat
- Nepal Army
- Abari
- Vishal Trade Link
- Building Energy Efficiency in Nepal (BEEN)
- Vishal Plastocab Ind. Pvt. Ltd
- Robotics Association of Nepal (RAN)
- Smart WASH

2.2 Conclave Delegates

The chief guest of the conclave was honorable Chairman of Nepal Engineering Council, Dr. Padma Bahadur Shahi; Er. Ganesh Shah, Former Minister of Environment, Science and Technology of Govt. of Nepal; Dr. Sunil Babu Shrestha, Former Vice Chancellor, Nepal Academy of Science and Technology (NAST); Prof. Dr. Tri Ratna Bajracharya, Former Dean, Institute of Engineering, Tribhuvan University; Prof. Dr. Sangeeta Singh, Tribhuvan University-Institute of Engineering, Former Member of National Planning Commission; Dr. Roshan Raj Shrestha, Deputy Director, Bill and Melinda Gates Foundation (virtually); Dr. Narayan Chaulagain, Senior Energy Expert at the Renewable Energy and Energy Efficiency Program of

the GIZ Nepal; Dr. Amod Mani Dixit, President, NSET; Prof. Dr. Amy R. Sapkota, University of Maryland, USA (virtually); Pragya Pradhan, Program Manager, UN Habitat; Nripal Adhikary, Founder , Abari; Subha Laxmi Shrestha, Assistant Director, AEPC; Pema Gyamtsho, Director General, ICIMOD; Bikash Gurung, President, Robotics Association of Nepal; Sudha Shrestha, Chief Technical Advisor, UN Habitat.

Chief Personals from government and non-government organizations were present at the event. Participants from various Engineering Colleges, Builders, Universities, and Companies attended the event.

SECTION 3: DAY WISE ACTIVITIES

Habitat Innovation Conclave 2023 was two days conclave. (See Appendix B: Conclave Schedule)

3.1 First Day: 16th March 2023

The first day activities are as follows:

3.1.1 Press Meet

Press Meet was organized on 16 March 2023. Various journalist participated in the event for the news coverage of Habitat Innovation Conclave 2023.

Summary of Press Meet:

It is said that there will be product exhibition, technical session and panel session at Conclave. The conclave will discuss innovative building materials, building codes, policies and standards, planning with new technologies, design and retrofitting, water and sanitation, energy efficiency in buildings and women in engineering and technology. The conclave has been organized to solve the problem of unorganized urbanization that is now seen through new ideas. This time the conclave is focused only on the building. It is said that it will be further refined in the coming year. In recent times, cities are becoming unliveable due to unplanned urbanization. Such problems have started to increase even in villages. Er. Ganesh Shah, advisor of Habitat Innovation Conclave and former Minister of Science and Technology, says that the program was organized to bring out innovative ideas to manage unorganized urbanization and make the city livable.

Similarly, Professor of Mechanical Engineering Department of Kathmandu University Dr. Bim Prasad Shrestha said that the program is going to be held with the aim of making the living quarters sustainable and environment friendly.

Eminent speakers will give their presentations on selected topics. Prof Dr. Sangeeta Singh, Dr. Dr. Shanti Kala Subedi, Prof. Dr. Amy R Sapkota, Bill and Melinda Gates Foundation Deputy Director Dr. Roshan Raj Shrestha, Senior Energy expert Dr. Narayan Chaulagain, Founder of Abari, Nirpal Adhikary, Program Manager of UN Habitat, Ms. Pragya Pradhan, and Dr. Amod Mani Dixit will give presentations.

Among the themes that came from the presentation were former Minister of Science and Technology Er. Ganesh Shah, former Vice Chairman of the National Planning Commission Prof.

Dr. Govinda Raj Pokharel, former vice chancellor of NAST Sunil Babu Shrestha and former Dean of Tribhuvan University, Institute of Engineering Studies Prof. Dr. Triratna Bajracharya will analyze and synthesize. The program is supported by the University Grants Commission. A report will be prepared summarizing the topics raised in the program. It is said that the prepared report will be provided to the Government of Nepal through the University Grants Commission.

3.1.2 Technical session



Prof. Dr. Bim Prasad Shrestha

“Improvement of Metallic Cooking Stove and Energy Efficiency”

Prof. Dr. Bim Shrestha is a well-known researcher and innovator in the field of sustainable energy in Nepal. He has developed and introduced many innovative solutions to improve the energy efficiency and sustainability of various industries in Nepal. In one of his presentations, Prof. Dr. Shrestha talked about the improvement of metallic cooking stoves and energy efficiency.

The cooking stove is one of the most important appliances in every household, especially in rural areas. In Nepal, most households still use traditional stoves made of mud or bricks, which are highly inefficient and polluting. These stoves consume a lot of fuel and emit harmful pollutants, which have adverse effects on the environment and human health. In this context, Prof. Dr. Shrestha developed a new metallic cooking stove that is highly efficient and reduces the environmental impact. The new stove design developed by Prof. Dr. Shrestha uses a unique combination of air inlets and outlets to increase the combustion efficiency of the stove. The stove features an insulated combustion chamber that keeps the heat inside, improving the cooking performance and reducing the risk of burns. The stove also has a chimney that removes the smoke and pollutants out of the house, reducing the indoor air pollution.

In his presentation, Prof. Dr. Shrestha highlighted the importance of using metallic cooking stoves in rural areas, where fuel scarcity is a significant problem. The new stove design is highly efficient and consumes less fuel than traditional stoves. The stove also produces less smoke and pollutants, making it a safer and healthier option for households. To demonstrate the effectiveness of the new stove design, Prof. Dr. Shrestha conducted a field study in rural Nepal, where he tested the stove's performance and energy efficiency. The study involved installing the

new stove in households and comparing it with traditional stoves in terms of fuel consumption, cooking performance, and indoor air pollution. The results of the study showed that the new stove design reduced fuel consumption by up to 50% compared to traditional stoves. The study also showed a significant improvement in indoor air quality, as the new stove design produced less smoke and particulate matter than traditional stoves. The families using the new stove also reported improved cooking performance and reduced cooking time. Prof. Dr. Shrestha emphasized that the new stove design is an eco-friendly and sustainable option for households in rural areas. The stove reduces the environmental impact, improves energy efficiency, and enhances the health and wellbeing of households. He also highlighted the need for more research and innovation in the field of sustainable energy to promote sustainable development in Nepal. In conclusion, Prof. Dr. Bim Shrestha's presentation on the improvement of metallic cooking stoves and energy efficiency showcased a promising solution to a significant problem in Nepal. The new stove design developed by Prof. Dr. Shrestha is highly efficient, consumes less fuel, and reduces indoor air pollution. The new stove design represents a significant step forward in achieving sustainable development in Nepal and could serve as a model for other countries facing similar challenges.



Er. Ganesh Shah

“Youth Participation in Innovation Technology and WASH”

Er. Ganesh Shah is a prominent Nepalese engineer and politician who has made significant contributions to the development of infrastructure and technology in Nepal. In one of his presentations, Er. Shah focused on the role of youth participation in innovation technology and WASH (Water, Sanitation, and Hygiene). Er. Shah began by emphasizing the importance of innovation technology and WASH for sustainable development in Nepal. He highlighted the challenges faced by the country in providing access to clean water, sanitation facilities, and hygiene education, particularly in rural areas. He also highlighted the importance of innovation technology in promoting sustainable development and addressing challenges such as climate change and natural disasters. Er. Shah emphasized the critical role that youth can play in promoting innovation technology and WASH in Nepal. He noted that Nepal has a large population of young people who are well-educated and have the potential to contribute significantly to the development of the country. However, he also noted

that many young people in Nepal face significant challenges in accessing education, employment opportunities, and resources to support their ideas.

Er. Shah discussed several initiatives that have been taken to promote youth participation in innovation technology and WASH in Nepal. He highlighted the work of organizations such as UNICEF, which has established WASH programs in schools and communities to promote hygiene education and improve access to clean water and sanitation facilities. He also discussed the work of the government of Nepal, which has established policies and programs to support innovation technology and entrepreneurship among young people.

Er. Shah also highlighted the importance of providing mentorship, training, and resources to young people to support their ideas and initiatives. He emphasized that many young people in Nepal have innovative ideas but lack the resources and support to turn those ideas into reality. He called for the establishment of programs and initiatives to provide young people with access to mentorship, training, and resources to support their innovation technology and WASH initiatives.

Er. Shah also discussed the importance of collaboration and partnerships between various stakeholders, including government, NGOs, the private sector, and academia, to promote innovation technology and WASH in Nepal. He emphasized that collaboration and partnerships could help to leverage resources and expertise to support innovation technology and WASH initiatives and address the challenges faced by young people in Nepal.

In conclusion, Er. Ganesh Shah's presentation on youth participation in innovation technology and WASH highlighted the critical role that young people can play in promoting sustainable development in Nepal. He emphasized the importance of providing young people with access to education, employment opportunities, mentorship, training, and resources to support their innovation technology and WASH initiatives. He also called for collaboration and partnerships between various stakeholders to leverage resources and expertise to address the challenges faced by young people in Nepal. Er. Shah's presentation serves as a call to action for stakeholders to prioritize youth participation in innovation technology and WASH and support their efforts to promote sustainable development in Nepal.



Prof. Dr. Tri Ratna Bajracharya

“Active Parameters for Energy Efficient Buildings”

Prof. Dr. Tri Ratna Bajracharya is a renowned Nepalese engineer who has made significant contributions to the field of energy-efficient buildings. In one of his presentations, he focused on the active parameters for energy-efficient buildings.

Prof. Bajracharya began by emphasizing the importance of energy-efficient buildings for sustainable development. He noted that buildings account for a significant portion of energy consumption and greenhouse gas emissions globally and highlighted the need for energy-efficient buildings to reduce energy consumption and mitigate the impacts of climate change. He discussed the concept of active parameters for energy-efficient buildings, which refers to the use of technology and automation to optimize building performance and reduce energy consumption. He noted that active parameters include a range of systems and technologies, such as heating, ventilation, and air conditioning (HVAC) systems, lighting systems, and building automation systems.

Prof. Bajracharya emphasized the importance of designing energy-efficient buildings from the outset and noted that it is much more difficult and expensive to retrofit existing buildings to improve energy efficiency. He discussed the importance of integrating active parameters into the design phase of building construction to ensure that energy efficiency is optimized.

He then discussed some of the key active parameters for energy-efficient buildings, including HVAC systems, lighting systems, and building automation systems. He noted that HVAC systems account for a significant portion of energy consumption in buildings and emphasized the importance of designing and implementing energy-efficient HVAC systems to reduce energy consumption. He discussed various strategies for energy-efficient HVAC systems, such as using high-efficiency heat pumps and reducing air leakage in ductwork. Prof. Bajracharya also discussed the importance of lighting systems for energy-efficient buildings. He noted that lighting accounts for a significant portion of energy consumption in buildings and emphasized the importance of using energy-efficient lighting systems, such as LED lighting, to reduce energy consumption. He also discussed the importance of implementing lighting controls, such as occupancy sensors and daylight sensors, to optimize lighting energy consumption. Finally, Prof. Bajracharya discussed the importance of building automation systems for energy-efficient

buildings. He noted that building automation systems can help to optimize energy consumption by controlling HVAC systems, lighting systems, and other building systems automatically based on occupancy and other parameters. He emphasized the importance of integrating building automation systems into building design and discussed various strategies for optimizing building automation systems, such as using wireless sensors and implementing machine learning algorithms.

In conclusion, Prof. Dr. Tri Ratna Bajracharya's presentation on active parameters for energy-efficient buildings emphasized the importance of designing energy-efficient buildings from the outset and integrating active parameters into building design. He highlighted the importance of HVAC systems, lighting systems, and building automation systems for optimizing building performance and reducing energy consumption. His presentation serves as a call to action for stakeholders to prioritize energy-efficient building design and implementation and to leverage technology and automation to optimize building performance and reduce energy consumption.



Dr. Sunil Babu Shrestha,

“Urban Planning and Habitat in relation to Environment and Climate change”

Dr. Sunil Babu Shrestha is a respected expert in the field of urban planning and environment. In his presentation, he addressed the critical role of urban planning and habitat in mitigating the effects of climate change on cities and the environment.

He began by explaining how the current urbanization trend is contributing to climate change, citing the rise in greenhouse gas emissions and urban heat island effect. Dr. Shrestha argued that urban planning can play a crucial role in reducing the impacts of climate change and promoting sustainable development. He emphasized the importance of integrating principles of sustainability and resilience into urban planning, highlighting the need to balance environmental, social, and economic objectives. Dr. Shrestha stressed that urban planning should take a holistic approach, considering the natural and social systems that underlie urban areas.

Dr. Shrestha then discussed the concept of habitat planning, which aims to integrate human settlements with natural systems. He argued that habitat planning can promote sustainability by preserving and enhancing the natural environment in urban areas. Dr. Shrestha presented various

strategies for habitat planning, including green infrastructure, which involves the use of natural systems like wetlands, forests, and rivers to manage storm water and enhance biodiversity.

He also discussed the role of green spaces in promoting sustainability and reducing the urban heat island effect. Dr. Shrestha argued that green spaces can help mitigate the impacts of climate change by providing shade, reducing heat, and absorbing carbon dioxide. He emphasized the need for urban planners to consider the location, size, and type of green spaces in their planning processes.

Dr. Shrestha then discussed the importance of transit-oriented development (TOD) in promoting sustainable urban development. He explained that TOD involves the development of compact, mixed-use neighbourhoods centred on transit hubs, which reduces the need for cars and promotes public transportation use. Dr. Shrestha emphasized the need for urban planners to consider TOD principles in their planning processes to reduce greenhouse gas emissions and promote sustainable transportation. He also highlighted the importance of waste management in promoting sustainability. Dr. Shrestha argued that waste management can contribute to reducing greenhouse gas emissions by diverting organic waste from landfills and using it for compost or energy production. He emphasized the need for urban planners to prioritize waste reduction and diversion in their planning processes.

In conclusion, Dr. Sunil Babu Shrestha's presentation on urban planning and habitat in relation to environment and climate change emphasized the importance of promoting sustainability and resilience in urban areas. He argued that urban planning should take a holistic approach, integrating principles of sustainability and resilience into planning processes. Dr. Shrestha highlighted the importance of habitat planning, green spaces, transit-oriented development, and waste management in promoting sustainability and reducing the impacts of climate change in urban areas. His presentation serves as a call to action for urban planners to prioritize sustainability and resilience in their planning processes to promote a more sustainable future for urban areas.

3.2 Second Day: 17th March 2023

The Habitat Innovation Conclave 2023 is an event that brings together experts and professionals in the field of sustainable habitat, technology, and innovation.

The conference aims to discuss and showcase innovative solutions that address the challenges of sustainable development, climate change, and urbanization. It typically includes keynote speeches from expert, panel discussions, technical sessions, product demonstration, and exhibitions.

3.2.1 Keynote Speech



Prof. Dr. Sangeeta Singh

"Innovation, Sustainability and Energy Efficiency in Urban Habitat Planning"

Dr. Sangeeta Singh is a Professor in Urban Planning and Director at the Center for Applied Research and Development (CARD) at the Institute of Engineering at Tribhuvan University. She is also former Member of National Planning Commission (NPC). Her topic of presentation was

"Innovation, Sustainability and Energy Efficiency in Urban Habitat Planning."

Dr. Sangeeta Singh highlighted in the field of urban habitat planning, with a particular focus on innovation, sustainability, and energy efficiency. In her presentation, she highlights the need for a balance between urbanization and ecosystem preservation, as well as the importance of sustainable development and economic growth. One of the key trends that Dr. Singh identifies is the global trend towards urbanization. She notes that the 21st century is the age of cities, with more and more people living in urban areas. In Nepal, for example, 66.03% of the population lives in urban areas, and the number of municipalities has increased from 58 in 2011 to 293 today. Dr. Singh points out that improper planning can lead to problems during disasters, and that the demand for land will continue to increase, as will the challenges associated with solid waste management. Moreover, the urban ecosystem is disturbing the natural ecosystem, creating a gap between nature and mankind that is increasing every day. If everyone were to live at the same standard as North Americans, we would need more than one Earth to sustain us. Therefore, it is essential to consider a balance between ecosystem and urbanization in future planning.

Dr. Singh also discusses the evolution of human habitats and the rise of automobiles, which has led to lower population density in some areas. She highlights the need for innovation to be sustainable and to address issues of sustainability in the 21st century, including the high consumption of non-renewable energy, the need for decentralized water supply and sewage

treatment, the unsustainability of vehicular-oriented streets, and the impact of increased consumerism. In terms of economic evolution, Dr. Singh argues that we are moving towards more unsustainable urban planning and that we need to think about decentralizing systems to make them more sustainable. Negative impacts of the IT industry should also be considered. She emphasizes the importance of sustainable development and social sustainability in addition to economic development. Sustainability concerns are a key challenge for urban planners, and Dr. Singh discusses the need to reduce reliance on fossil fuels, promote energy-efficient buildings, and improve transportation. She suggests that we need new models of sustainability, such as the 3P model of People-Planet-Profit and the triple bottom line approach. There are also global policies, such as the Sustainable Development Goals related to Habitat, the annual Conference of Parties, and sustainability concerns, those urban planners must take into consideration.

Dr. Singh highlights different models of city planning, including the Green City approach, the Radiant City, and the One Acre City, and emphasizes the need to consider the urban cycle when developing urban ecosystems, in addition to the natural cycle. Key sustainability parameters for urban habitats include energy efficiency, motility and transportation, sustainable water and wastewater management, blue and green infrastructure management, and circular economy principles. Dr. Singh provides several examples of innovative solutions that address sustainability concerns. For example, in Amsterdam, infrastructure for cycling and walking has helped to reduce reliance on cars. In Colombia, elevators with built-in solar panels have been introduced as a form of sustainable transportation. Water-sensitive urban design, green infrastructure retrofitting, and circular economy principles are other examples of sustainable solutions. Dr. Singh also emphasizes the importance of affordable and accessible housing, and notes that we should not blindly follow Western designs but consider local needs and resources.

In conclusion, Dr. Singh's work highlights the need for a sustainable approach to urban habitat planning, which takes into account the balance between ecosystem and urbanization, the need for innovation to be sustainable, and the importance of economic, social, and environmental sustainability. Her examples of innovative solutions demonstrate that sustainable urban planning is possible, and that it is essential for the future of our cities and our planet.

3.2.2 Technical Session



Dr. Roshan Raj Shrestha

“Innovation on Sanitation for urban Habitat”

Dr. Roshan Raj Shrestha associated with Bill & Melinda Gates Foundation as a Deputy Director, Global Growth and Opportunity Division, Water, Sanitation and Hygiene (WASH) team in Seattle, US. He is an expert in sanitation and is focused on transforming sanitation in developing countries. In a talk titled “Innovations on Sanitation for Urban Habitat,” Dr. Shrestha highlights the importance of innovation in sustainable human waste management to address increasing water scarcity. Dr. Shrestha points out that there is a need for innovation in sanitation to conserve water resources. However, he notes that there are several reasons why progress has been slow in this area. Firstly, there has been a focus on running behind technologies without thinking about their business and service models. Secondly, sanitation has not been treated as a public service, and the value of operations and maintenance (O&M) has not been considered. Thirdly, there are no standards, lack of accountability, and regulatory bodies. Fourthly, there has been an emergence of faecal sludge management. Despite the challenges, Dr. Shrestha is optimistic about the potential for innovation in sanitation. He mentions the reinvented toilet, which can be used in households and commercial buildings. The reinvented toilet addresses the limitations of incumbent technology and eliminates pathogens, conserves water, is attractive, and affordable. The significance of the reinvented toilet is that it presents an opportunity to transform sanitation. The ISO 30500 standard has been adopted in 29 countries, and there is a household reinvented toilet tech in the pipeline that is not yet available for purchase. Dr. Shrestha notes that technical expertise investment is needed to integrate investment with innovation, and the Asian Institute of Technology (AIT) will help in this regard. He mentions that the innovative toilet is a one-time investment and is cheaper than considering all the costs of a sewage system. He highlights the good support from the government of Nepal and emphasizes that expertise is more important than financial investment. Dr. Shrestha also talks about the Foundation's prioritization of the transformation of sanitation for over ten years, with lots of money invested and big support from Bill Gates. He notes that there is a question about commercializing services and mentions that the Foundation is working in China and India.

He sees significant opportunities to transform sanitation in India via the reinvented toilet, with a potential \$3 billion USD opportunity. Dr. Shrestha also mentions the Aquanic 600 treatment process, with more than 19 advanced technologies looking for a commercial partner. He outlines the four key elements required for successful adoption of these technologies, which are marketplace readiness, awareness and perception, early adoption, and technical and GTM assistance. He notes that India is the best country for sanitation concern.

In response to questions from participants, Dr. Shrestha highlights the importance of collaboration between countries and the need for government coordination with INGOs. He sees lots of scope for knowledge in sanitation engineering and suggests that universities should not limit research to thesis but also focus on implementation. He recommends cost analysis and estimating the cost of a sewage system in a village and presenting proposals to mayors. Dr. Shrestha also discusses the challenges and benefits of using technology for digestion.

In conclusion, Dr. Roshan Raj Shrestha is a leading expert in sanitation, and his talk on Innovations on Sanitation for Urban Habitat highlights the importance of innovation in sustainable human waste management. He sees great potential in the reinvented toilet and other advanced technologies and stresses the need for collaboration between countries, government coordination with INGOs, and technical expertise investment to integrate investment with innovation.



Dr. Narayan Prasad Chaulagain

“Energy Efficiency in Buildings”

Dr. Narayan Prasad Chaulagain is a Senior Energy Expert at the Renewable Energy and Energy Efficiency Program of the GIZ Nepal. His area of expertise is energy efficiency in buildings, and he advocates for its mainstreaming in energy and development planning. According to Dr. Chaulagain, energy efficiency is not a sacrifice of comfort, but rather the efficient consumption of energy by using appropriate tools, technology, or appliances. Measured by the amount of energy required to produce per unit of goods or services, energy efficiency is essential for any country's path to prosperity. In his work, Dr. Chaulagain emphasizes the importance of energy efficiency in the building sector, which accounted for 30% of global final energy consumption and 27% of total global emissions in 2021. He points out that energy use in

buildings has increased by 17.4% in the last ten years, and the building sector, along with the transport and industrial sectors, can contribute significantly to reducing global CO2 emissions between 2010 and 2040. Dr. Chaulagain identifies several ways to achieve energy efficiency in buildings, such as proper building design, integration of multiple design professionals, use of energy-efficient materials and equipment, and integration with renewables such as solar PV. However, he notes that several challenges hinder energy efficiency in buildings in Nepal, including gaps in information, communication, and education; coordination gaps among different agencies and professionals; supply-side dominated energy policies and mindsets; lack of appropriate energy efficiency policy and regulatory framework; and financial, technological, and human resource gaps.

To address these challenges, Dr. Chaulagain suggests mainstreaming energy efficiency in overall energy and development planning, raising awareness of energy efficiency, establishing proper policy, regulatory, and institutional frameworks to support energy efficiency, establishing financing and incentive systems for energy efficiency, creating appropriate tariff/price structures, and establishing appropriate systems of energy efficiency benefit sharing. Overall, Dr. Chaulagain's work highlights the importance of energy efficiency in buildings and the need for concerted efforts to overcome the challenges that hinder its implementation.



Dr. Shanti Kala Subedi

“Building Code, Policy and Standard

Dr. Shanti Kala Subedi is chief of Research and Innovation Unit at Himalaya College of Engineering Managing Director of Krishnam Smart Engineering Solution Pvt. Ltd.

Dr. Shanti Kala Subedi is a renowned expert in building codes, policies, and standards. Building codes serve to ensure public health, safety, and welfare in the construction and occupancy of buildings and structures. When formally enacted by appropriate governmental or private authority, building codes become laws of a particular jurisdiction. The guidelines for the arrangement of building structural systems include structural simplicity and uniformity, symmetry and redundancy, adequate resistance and stiffness, and diaphragm action. Nepal has eight typologies of buildings, including adobe, brick in mud mortar, stone in mud mortar, brick in cement mortar, and stone in cement mortar, wooden, non-engineered building, and engineered

building. After the 2015 massive earthquake, Nepal drafted the first building for seismic design of buildings as NBC 105 in 2020 AD. The concept of building bye-laws is necessary to ensure public health and safety, planned urban development, and planned built environments. Building bye-laws are generally made by planning organizations of the government either from the central level or from the local level. Building bye-laws deal with issues such as the right of way (ROW), setback, floor area ratio (FAR), ground coverage ratio (GCR), height of the building, guidelines for cultural heritage zone, clearance required from important sites, etc. Self-healing concrete is a type of concrete that can heal itself from microcracks formed in it and regain its original state. The Building Code Implementation Program in Municipalities of Nepal (BCIPN) has been launched to support municipal governments in Nepal to develop and administer building permits and control systems to improve the seismic performance of new building constructions. Furthermore, the implementation of the Nepal National Building Code through an automated building permit system is underway. As the chief of the Research and Innovation Unit at Himalaya College of Engineering and Managing Director of Krishnam Smart Engineering Solution Pvt. Ltd., Prof Dr. Shanti Kala Subedi is involved in developing innovative solutions to address building code, policy, and standard issues in Nepal. Her work in building codes, policies, and standards is essential in ensuring public health, safety, and welfare in building construction and occupancy.



Dr. Amod Mani Dixit

“Assessment and implementation of Disaster Reduction for Resilient Settlement”

Dr. Amod Mani Dixit is the President of the National Society for Earthquake Technology (NSET), and his work focuses on the assessment and implementation of disaster reduction for resilient settlements. In the past, the focus was on strengthening individual homes to withstand earthquakes, but now the emphasis has shifted to strengthening communities and nations. The Udayapur Earthquake in 1988 resulted in 16 deaths, prompting the need for building codes. NSET was established in 1993 to address seismic risks.

The National Building Code was drafted between 1992-1994, as more than 80% of houses in Nepal were built by masons or contractors without proper design and supervision by engineers.

In 1997-1998, the Kathmandu Valley Earthquake Risk Management Project (KUERMP) was launched under the Asian Urban Disaster Mitigation Project. Only 7% of houses in Nepal are professionally designed, while the rest are built by masons. NSET's mission is to connect the government with academia and the community. Its focus is on training illiterate masons to address non-engineered buildings, through awareness, capacity development, and policy. More than 47% of natural disasters in Nepal occur between April and August, resulting in over 65% of deaths. The annual Earthquake Safety Day (2nd Magh) is observed by the central government, ministry and department of urban development, municipalities, contractors, schools and pupils, cultural groups, and the people.

Municipal disaster risk reduction (DRR) programs are necessary for better habitat. This includes airports, road networks, bridges, water supply, hospitals and health facilities, electricity and telephony, and emergency response capacity. NSET has trained over 4700 engineers, 24,530 masons, 3,485 community personnel, 4,357 government officials, and 9,320 emergency responders on disaster safety and safer construction. It has contributed to the development of 39 policy documents and assisted 51 municipalities with building code implementation for safer habitats.

NSET has launched the Sajag Nepal program to improve decision-making and preparedness to mitigate the impacts and reduce the risks from mountain hazard chains in Nepal. METEOR, launched in 2018, aims to deliver and use open-source national-scale exposure datasets for multi-hazard analysis by Nepalese, Tanzanian, and global stakeholders. NSET's objective is to catalyse the transition from crisis management to multi-hazard risk-informed planning and decision-making that strengthens the voice and capacity of the people.



Nripal Adhikary

“Innovative Building Materials: Using past as a guide to the future”

Nripal Adhikary is the founder of the Abari Bamboo and Earth Initiative, which aims to promote the use of bamboo as an innovative building material for sustainable and culturally significant architecture. Bamboo is a locally available material and is the fastest-growing plant in the world, with 54 species found in Nepal. Approximately 10% of Nepalese

people depend on bamboo for their livelihood. Bamboo has high sugar content and is an ideal material for construction due to its flexibility, strength, and resilience. Adhikary has designed and constructed schools, libraries, bridges, and halls using bamboo, without compromising safety. He has used a lightweight roofing and independent wall construction technique to make the buildings more earthquake-resistant. Adhikary's approach to architecture is based on using past techniques to create a sustainable future. He has designed buildings that are culturally significant and use locally available materials.

In addition to using bamboo for construction, Adhikary has also experimented with bamboo cultivation for the regeneration of humus in Madi, Chitwan. After four years, Madi achieved greenery with bamboo, and after eight years, a full jungle ecosystem was recovered. Adhikary follows the Indian Standard (IS) codes for the design and construction of bamboo buildings. He has also conducted workshops and training sessions to promote the use of bamboo as a building material and to train masons and engineers on how to construct bamboo buildings.

Adhikary's innovative approach to architecture has gained recognition nationally and internationally. He has won several awards, including the 2017 Asia-Pacific Low-Cost Housing Award and the 2020 A+ Awards Architizer. Adhikary's work demonstrates how traditional building materials and techniques can be used to create sustainable and culturally significant architecture. His work with bamboo and other locally available materials has the potential to revolutionize the way buildings are constructed in Nepal and other parts of the world.



Ms Pragya Pradhan

“Carrier Journey and Women in Technical Field”

Ms. Pragya Pradhan is a program manager at UN-Habitat and she shared her career journey and thoughts on women in technical fields at a conclave. Her journey began with the support of her mother and she pursued a bachelor's degree in architecture and dance in parallel. After completing her bachelor's degree, she worked for architecture companies and then received a scholarship to study a master's in urban planning in the United States. She completed her master's degree in two years while also working 20 hours per week.

Upon completing her studies, Ms. Pradhan returned to Nepal and started working with various NGOs. During her presentation, she emphasized the need for more women in technical fields.

She acknowledged that being a female in a male-dominated industry can be difficult, and that women often try to fit in rather than demand their rights. However, she encouraged women to be bold and not be confined by social biases. Ms. Pradhan also discussed the importance of inclusive government and community development. She pointed out that the bachelor's course did not focus much on social dimensions for infrastructure development. She stressed that it is important to create an inclusive society from the ground up, starting with communities and municipalities. This includes making buildings and roads accessible for women, children, people with disabilities, and minorities.

Ms. Pradhan highlighted the importance of self-motivation and advocating for the rights of underrepresented groups. She also emphasized that quality of life is not provided equally and that marginalized groups such as women, gender minorities, homeless individuals, and people with disabilities still struggle. To create a more inclusive society, she suggested retrofitting cities to make them accessible for everyone and engaging with policy makers to advocate for the rights of underrepresented groups.

Overall, Ms. Pragya Pradhan's presentation emphasized the importance of gender equity in technical fields and the need for inclusive community development. She encourages women to be bold, self-motivated and advocates for the rights of underrepresented groups.



Dr. Amy R. Sapkota

Agricultural and / or municipal water re-use

Dr. Amy is an environmental health professor and director of the CONSERVE Centre of Excellence at the University of Maryland.

Her talk on reimagining solutions for emerging contaminants in recycled irrigation water aims to address global water scarcity, which is a major problem affecting agricultural irrigation.

Agriculture is the biggest user of fresh water globally, and by 2040, it is predicted that a third of the world will be in high or extremely high-water stress. As the demand for agricultural irrigation is increasing, water shortages caused by factors such as climate change and urbanization will threaten water resources. To meet the future food demand for close to 10 billion people by 2050, we will need to increase global ag output by as much as 70%, using less water and transitioning to renewable energy technologies. One solution is to use recycled water in agricultural irrigation,

which can be municipal wastewater, greywater or reclaimed water. Dr. Sapkota's centre aims to facilitate the adoption of transformative on-farm water treatment solutions that can enable the safe reuse of non-traditional or recycled irrigation water on food crops.

The CONSERVE Centre of Excellence has three research areas: evaluating the overall chemical, microbial, and physical water quality of recycled irrigation water resources; developing and evaluating on-farm treatment technologies that can successfully treat these water resources; and extension and outreach with farming communities and experiential education.

One study conducted by the centre evaluated the overall water quality of recycled irrigation water resources by collecting water samples from 22 field sites in the Mid-Atlantic and Southwest regions of the United States. Over 600 water samples were collected and analysed for bacterial indicators like E. Coli, bacterial pathogens like Salmonella and Listeria, antibiotic-resistant bacteria, and pharmaceuticals. The findings revealed diverse contaminants and levels of E. Coli in the water resources, but Dr. Sapkota emphasized that there is no bad water, and whatever water is available can be treated to a specific level for the right use at the right space and the right time.

Dr. Sapkota also discussed the effectiveness of a new treatment technology developed by her centre, Zero Valent Iron Sand Filtration. This technology uses iron sand, which is abundant and inexpensive, to remove contaminants from water. The iron sand acts as a sponge, absorbing contaminants as water passes through it. The technology has shown promising results in removing organic and inorganic contaminants from recycled irrigation water resources. Dr. Sapkota's centre is also developing an integrated water-energy-food systems approach that can enable safe and sustainable food production using recycled water. This approach involves optimizing the use of water, energy, and nutrients to achieve high crop yields with less water and energy inputs. It also involves recycling waste and using it as a resource to produce energy and nutrients.

In conclusion, Dr. Sapkota's talk highlights the importance of using recycled water in agricultural irrigation to meet the future food and water demand. It also emphasizes the need for transformative on-farm water treatment solutions that can enable safe and sustainable food production using recycled water. The centre's research areas and findings reveal the diverse contaminants in recycled irrigation water resources and the effectiveness of new treatment technologies like Zero Valent Iron Sand Filtration. The centre's integrated water-energy-food

systems approach can also provide a sustainable solution to the challenges of global water scarcity and food demand

3.2.3 Panel Discussion

The panel discussion, moderated by Prof. Dr. Bim Prasad Shrestha, brought together several experts to discuss how to make cities more liveable and energy-efficient. The speakers included Er. Ganesh Shah, Dr. Sunil Babu Shrestha, Prof. Dr. Tri Ratna Bajracharya, and Subha Laxmi Shrestha. The speakers emphasized the need for climate-resilient cities, which can be achieved through rainwater harvesting, waste management and recycling, and energy efficiency in building design. They also stressed the importance of involving local government in city planning and developing green building codes and green procurement policies.

Prof. Dr. Tri Ratna Bajracharya emphasized that energy efficiency is not a sacrifice, but a necessary aspect of sustainable development. He stressed the importance of considering the security and safety of buildings and their surroundings in urbanization. He also highlighted the need for entropism in urban development, as agricultural land is decreasing and land management planning is required. Dr. Sunil Babu Shrestha emphasized that energy efficiency and innovation are necessary to achieve sustainable development without compromising quality of life and comfort. He suggested that research and development should be focused on innovation, and that government should prioritize it. He also stressed the need for green building codes and green procurement policies, and for local government to develop policies for sustainable development.

Ms. Er. Subha Laxmi Shrestha emphasized that habitat should be a living and loving environment, and that energy efficiency should be considered from the beginning of building design. She suggested that energy efficiency can be achieved through continuous awareness, audit, post audit, and research and development in collaboration with different organizations, both private and public. She also stressed the need for energy access and the importance of HVAC loads in energy consumption. During the discussion, Er. Ganesh Shah suggested that the impact of the program will be seen after 10 years, and that a second habitat innovation conclave should be conducted for two days. Prof. Dr. Tri Ratna Bajracharya suggested that the event should be organized through the calendar every year, and that young master minds should be given a chance to speak. Dr. Sunil Babu Shrestha stressed the need for action-oriented work and

strategic adoption. Subha Laxmi Shrestha suggested that such discussions should be continued in the coming days.

Overall, the panel discussion emphasized the importance of sustainable development and energy efficiency in city planning and building design. The speakers emphasized the need for collaboration between different organizations and the involvement of local government in city planning. They also stressed the importance of continuous awareness, research and development, and green building codes and procurement policies for achieving sustainable development.

3.2.4 Q&A Session

The Habitat Innovation Conclave 2023 is an event that brings together experts in habitat design and technology to discuss the latest innovations and trends in the field. The event is designed to explore new ways of designing and building habitats that are sustainable, resilient, and adaptable to changing environments. During the question and answer session, participants likely had the opportunity to ask questions and share their perspectives on various topics related to habitat innovation. These topics may have included new materials and construction techniques, smart homes and cities, sustainable energy solutions, and more.

Overall, the Habitat Innovation Conclave 2023 is a valuable forum for exchanging ideas and exploring new approaches to habitat design and technology. The insights and perspectives shared during the event can help drive innovation and progress in this important field.

3.2.5 Product Demonstration

The Habitat Innovation Conclave 2023 was an exciting event that featured the latest products, services, and innovations in the field of habitat development. One of the key aspects of the event was the product demonstration stalls, which provided an opportunity for companies to showcase their latest offerings to potential customers and investors. Asian Paints, paint partner with their sister company bath sense, Gorkha Eco Panel, Vishal Plastocab, Heritage Nepal, Micro & Mega Futurestic showcased their innovative building products. The product demonstration stalls at the Habitat Innovation Conclave 2023 were an integral part of the event, as they offered a unique opportunity for companies to engage with their target audience directly. This was particularly important in the field of habitat development, where products and services needed to be tailored to the specific needs of different stakeholders.

At the product demonstration stalls, companies had the opportunity to showcase their latest innovations, technologies, and products to a captive audience. This provided an opportunity for

attendees to learn more about the latest trends in the industry and get a first-hand look at the products and services that were currently available. The product demonstration stalls were located in a central area of the Habitat Innovation Conclave 2023, making them easily accessible to all attendees. Each stall was designed to showcase a specific product or service, with displays, interactive demonstrations, and informational materials to help attendees better understand the product or service being offered. Companies had the opportunity to customize their product demonstration stalls to meet their specific needs and requirements. This included the use of interactive displays, video presentations, and other marketing materials to help showcase their products and services in the best possible light. One of the key benefits of the product demonstration stalls at the Habitat Innovation Conclave 2023 was the opportunity for companies to engage with potential customers and investors. Attendees were able to ask questions, provide feedback, and share their thoughts and ideas with the companies showcasing their products and services. This interaction was incredibly valuable for companies, as it provided an opportunity to learn more about the needs and preferences of their target audience. This helped companies to better tailor their products and services to meet the needs of their customers, ultimately leading to increased sales and customer loyalty.

In addition to engaging with potential customers and investors, the product demonstration stalls at the Habitat Innovation Conclave 2023 also provided an opportunity for companies to network with other industry professionals. This helped companies to form valuable partnerships, share knowledge and resources, and stay up-to-date with the latest trends and developments in the field of habitat development. The product demonstration stalls at the Habitat Innovation Conclave 2023 also provided attendees with a unique learning experience. By interacting with the products and services on display, attendees were able to gain a deeper understanding of the latest innovations in the field of habitat development, as well as the challenges and opportunities that existed within the industry.

Overall, the product demonstration stalls at the Habitat Innovation Conclave 2023 played an important role in showcasing the latest innovations, technologies, and products in the field of habitat development. By providing companies with an opportunity to engage with potential customers and investors, network with other industry professionals, and gain valuable insights into the latest trends and developments, the product demonstration stalls were a key highlight of the event for all attendees.

SECTION 4: CLOSING SESSION

The Habitat Innovation Conclave 2023, held on March 17, 2023, was a remarkable event that brought together experts, scholars, and policymakers from around the world to discuss sustainable development and habitat innovation. The conference focused on the pressing issue of building sustainable and eco-friendly habitats for the future. The event featured several keynote speakers and panel discussions on green building technologies, urban planning, and sustainable development, offering valuable insights and actionable ideas for the participants.

In his closing remarks, Er. Ganesh Shah, the Former Minister of Environment, Science and Technology of Govt. of Nepal, acknowledged the significance of the event in advancing sustainable development efforts worldwide. He emphasized the need for collaborative efforts to address the challenges of habitat innovation, and stressed the importance of adopting innovative solutions to achieve sustainable development goals. Er. Shah also highlighted the role of technology in driving sustainable development, and the need for incorporating green building technologies and practices in urban planning. He called on the participants to continue to work together and share their knowledge and expertise to accelerate progress towards building a sustainable future for all.

In conclusion, the Habitat Innovation Conclave 2023 was a significant event that generated new ideas and strategies for building sustainable habitats. The closing remarks by Er. Ganesh Shah served as a reminder of the importance of collaborative efforts, innovation, and technology in achieving sustainable development goals. It is hoped that the ideas and strategies generated at the event will inspire concrete actions and positive change in the coming years.

SECTION 5: ACHIEVEMENT AND OUTCOMES

The Habitat Innovation Conclave 2023 has been a success in driving sustainable urban development through the exploration of six thematic areas. The first of these is innovative building materials. The conclave has promoted the use of sustainable, energy-efficient materials that have a lower carbon footprint. The event has provided a platform for experts to showcase new materials and for policymakers to understand how they can be integrated into building codes and standards. Another area of focus has been building codes, policies, and standards. The Habitat Innovation Conclave has facilitated discussions on how to improve building codes and standards to promote sustainable urban development. Experts have shared their experiences in developing and implementing building codes and have identified the need for increased collaboration between different stakeholders to drive positive change. The conclave has also highlighted the importance of planning, design, and retrofitting with emerging technologies. The event has provided insights into how technology can be used to improve urban planning and design, and retrofit existing buildings to make them more sustainable.

The Habitat Innovation Conclave has also addressed the critical issue of water and sanitation in urban areas. The event has brought together experts and stakeholders to discuss innovative solutions for water management, sanitation, and waste management. The conclave has highlighted the need for sustainable water management practices and the use of technology to improve water efficiency in urban areas. Energy efficiency in buildings has also been a key area of focus at the Habitat Innovation Conclave. The event has showcased how energy-efficient buildings can help reduce energy consumption, greenhouse gas emissions, and costs. Experts have discussed the latest technologies and strategies for improving energy efficiency in buildings and have emphasized the need for policies and incentives to promote their adoption.

Finally, the Habitat Innovation Conclave has promoted the participation of women in engineering and habitat. The event has provided a platform for women to showcase their innovative ideas and to discuss their experiences in the field. The conclave has highlighted the importance of gender diversity in the engineering and habitat sectors, and the need for equal opportunities and representation for women. The event has encouraged more women to enter these fields and has provided a supportive community for women professionals in the sector.

Overall, the Habitat Innovation Conclave 2023 has been successful in driving sustainable urban development by promoting innovative solutions and facilitating collaborations between different

stakeholders. The event has provided a platform for experts to share their knowledge and experiences and for policymakers to understand the challenges and opportunities in sustainable urban development. The Habitat Innovation Conclave has contributed to creating a more sustainable and resilient future for urban areas.

SECTION 6: CHALLENGES AND WAY FORWARD

Despite the success of the Habitat Innovation Conclave 2023, there are still several challenges that need to be addressed to ensure sustainable urban development. One of the key challenges is the lack of awareness and understanding of sustainable urban development among policymakers, industry professionals, and the general public. This highlights the need for more education and awareness-raising initiatives to promote sustainable urban development. Another challenge is the lack of adequate funding and resources for sustainable urban development initiatives. Governments and private sector stakeholders need to invest more in sustainable urban development projects and research to drive positive change. The Habitat Innovation Conclave can play a key role in bringing together stakeholders to explore funding and financing options for sustainable urban development. The conclave also needs to ensure that it engages with and includes marginalized communities in discussions and decision-making processes related to sustainable urban development. This includes ensuring that these communities have access to the resources and opportunities needed to participate in sustainable urban development initiatives.

Finally, the Habitat Innovation Conclave needs to continuously evolve to stay relevant and address emerging challenges and opportunities. The event needs to adapt to new technologies, trends, and ideas, and incorporate new thematic areas as needed to ensure that it remains at the forefront of sustainable urban development.

In conclusion, the Habitat Innovation Conclave 2023 has made significant strides in promoting sustainable urban development. However, there are still several challenges that need to be addressed to ensure that these efforts are sustained and amplified. Through increased education and awareness-raising, increased funding and resources, inclusion of marginalized communities, and continuous evolution, the Habitat Innovation Conclave can continue to drive sustainable urban development and make a positive impact on the world.

SECTION 7: CONCLUSION AND RECOMMENDATIONS

The Habitat Innovation Conclave 2023 has been a valuable platform for stakeholders from different sectors and regions to come together and promote sustainable urban development. The conclave has generated numerous ideas, initiatives, and partnerships that can drive positive change and make a lasting impact on the world. However, to ensure that these efforts are sustained and amplified, it is essential to address the challenges facing sustainable urban development.

Based on the outcomes of the conclave, we recommend the following priorities: First, we recommend that the conclave continues to focus on cross-sectoral partnerships and collaborations. Sustainable urban development requires the participation of different stakeholders from different sectors, and the Habitat Innovation Conclave can serve as a platform for facilitating these collaborations.

Second, stakeholders must adopt a context-specific approach to sustainable urban development. This involves addressing the unique needs and challenges of different regions and communities, taking into account the local context and conditions. By doing so, stakeholders can develop sustainable urban development initiatives that are more effective and inclusive.

Third, it is essential to advocate for policy changes that prioritize sustainable urban development. Governments and policymakers must take concrete actions to address the challenges facing urban areas, and the Habitat Innovation Conclave can play a vital role in promoting these policy changes.

Finally, we recommend that the Habitat Innovation Conclave develops mechanisms for monitoring and evaluating the impact of its initiatives and for encouraging stakeholders to implement sustainable urban development practices in their own projects and initiatives. This will help to ensure that the efforts of the Habitat Innovation Conclave have a sustained impact on the world.

Overall, we believe that the Habitat Innovation Conclave has the potential to drive positive change and make a lasting impact on the world. By continuing to focus on cross-sectoral partnerships, context-specific approaches, policy advocacy, and sustained impact, the Habitat Innovation Conclave can continue to promote sustainable urban development and create a better world for all

SECTION 8: FEEDBACK FROM PARTICIPA

Habitat Innovation Conclave 2023 had the potential to be a valuable and inspiring event that drives innovation and progress in the field of habitat design and technology. The feedback from the participants, authors, and delegates are listed below:

- The event provided valuable insights into the latest innovations and trends in habitat design and technology.
- The opportunity to learn from experts in the field and engage in interactive discussions and workshops was highly appreciated.
- The event facilitated valuable networking opportunities with like-minded professionals from a diverse range of backgrounds and industries.
- The event showcased cutting-edge research and showcased new approaches to building sustainable, resilient, and adaptable habitats.
- The event was well-organized, with a strong focus on creating an inclusive and collaborative environment that fostered learning and idea-sharing.

The feedback provided by participants was highly valued by event organizers, and helped shape future events to better meet the needs and interests of the participants and the industry as a whole.

SECTION 9: ANNEX

Conclave Schedule

Details of the Program Syllabus/Agenda

Day 1 (Only for Organizing Committee)

16th March 2023

Time (NPT)	Agenda	Remarks
8:00-9:30 a.m.	Registration / Press Meet	
09:30-09:45 AM	Opening Session	
9:00 - 9:05 AM	Call on the Dias	All distinguished
9:10-09:25 AM	Welcome Remarks	Prof. Dr. Bim Prashad Shrestha, Convener
09:25 -10:30 AM	Improvement of Metallic Cooking Stove and Energy Efficiency	Prof. Dr. Bim Prasad Shrestha, Convener, Kathmandu University
10:30-10:45 AM	Discussion - Q & A	
10:45 - 11:30 AM	Youth Participation in Innovation Technology and WASH	Er. Ganesh Shah , Former Minister of Environment, Science and Technology, Government of Nepal
11:30-11:45 AM	Discussion - Q & A	

11:45-12:15 PM	Tea Break	
12:15 -01:00 PM	Active Parameters for Energy Efficient Buildings	Prof. Dr. Tri Ratna Bajracharya, Former Dean, Institute of Engineering, Tribhuvan University
01:00 -01:15 PM	Discussion - Q & A	
01:15-02:15 PM	Lunch Break	
02:15-03:00 PM	Urban Planning and Habitat in relation to Environment and Climate change	Prof. Dr. Sunil Babu Shrestha, Former Vice Chancellor, Nepal Academy of Science and Technology (NAST)
03:00 -03:15 PM	Discussion - Q & A	
04:15-04:30 PM	Closing Remarks	Prof. Dr. Bim Prasad Shrestha, Convenor

Table -1 Conclave Schedule

Day 2 (For Participants / Sponsors / Speakers / Demonstrators)

17th March 2023

Time	Agenda	Remarks
8:00-9:00 AM	Registration	
9:00-10:45 AM	Inaugural Session	
9:00 - 9:05 AM	Call on the Dias	All Distinguished
9:05-9:10 AM	National Anthem	
9:10-09:20 AM	Welcome Remarks	Prof. Dr. Bim Prasad Shrestha , Convenor
9:20 - 9:25 AM	Formal Inauguration / Panas Lighting	Chief Guest, Dr. Padma Bahadur Shahi , Chairman, Nepal Engineering Council
9:25 - 10:00 AM	Innovation, Sustainability and Energy Efficiency in Urban Habitat Planning (Keynote Speech)	Prof. Dr. Sangeeta Singh , Deputy Director of Centre for Disaster Studies, Tribhuvan University - Institute of Engineering, Former Member of National Planning Commission
10:00 – 10:10 AM	Remarks by Chief Guest	Dr. Padma Bahadur Shahi, Chairman, Nepal Engineering Council
10:10 - 10:15 AM	Closing Remarks of Inaugural Session	Er. Ganesh Shah , Former Minister of Environment, Science and Technology, Government of Nepal
10:15-10:45 AM	Tea Break	
10:45-12:30 PM	Technical Session-1	

10:45-11:15 AM	Innovation on Sanitation for Urban Habitat	Dr. Roshan Raj Shrestha , Deputy Director, Bill and Melinda Gates Foundation
11:15-11:45 AM	Energy Efficiency Issues and Challenges in Nepal with Focus on Building	Dr. Narayan Chaulagain , Senior Energy Expert, Renewable Energy and Energy Efficiency Program, GIZ, Nepal
11:45-12:15 PM	Building Codes, Policies and Standards	Dr. Shanti Kala Subedi , Chief, Research and Innovation Unit, Himalaya College of Engineering, MD, Krishnam Smart Engineering Solution Pvt. Ltd.
12:15 - 12:30 PM	Discussion - Q & A	
12:30-1:30 PM	Lunch Break /Product Demonstration	
1:30-1:45 PM	Sponsors Time	
1:45: - 3:00 PM	Technical Session-2	
1:45- 2:15 PM	Assessment and implementation of Disaster Reduction for Resilient Settlement	Dr. Amod Mani Dixit , President, National Society for Earthquake Technology
2:15 - 2:45 PM	Innovative Building Materials	Mr. Nripal Adhikary , Chairman, Abari Bamboo and Earth Initiative
2:45-3:15 PM	1. Career journey and focus on the GESI dimension in urban planning	Ms. Pragya Pradhan , Program Manager, UN Habitat
	2. Agricultural and / or municipal water reuse	Dr. Amy R. Sapkota , Phd, MPH, Professor University of Maryland, College Park, MD 20742, USA, Director, CONSERVE: A Center of Excellence at the Nexus of Sustainable Water Reuse, Food and Health
3:15-3:30 PM	Discussion - Q & A	

3:30-3:45 PM		03/17/23 4:45-5:00 AM	Tea Break
3:45-4:45 PM	Panel Discussion	Er. Ganesh Shah , Former Minister of Environment, Science and Technology, Government of Nepal	
		Prof. Dr. Govinda Raj Pokharel , Former Vice Chair of National Planning Commission	
		Dr. Sunil Babu Shrestha , Former Vice Chancellor, Nepal Academy of Science and Technology (NAST)	
		Prof. Dr. Tri Ratna Bajracharya , Former Dean, Institute of Engineering, Tribhuvan University	
		Ms. Subha Laxmi Shrestha , Assistant Director, Alternative Energy Promotion Centre, Government of Nepal	
		Moderator: Prof. Dr. Bim Prasad Shrestha	
4:45-5:00 PM	Closing Ceremony / Felicitation	Er. Ganesh Shah , Former Minister of Environment, Science and Technology, Government of Nepal	

Some Glimpse of the Program



Fig: 1 Welcome remarks by Prof. Dr. Bim Prasad Shrestha



Fig: 2 Remarks by Chief Guest Dr. Padma Bahadur Shahi and Keynote speech by Prof. Dr. Sangeeta Singh



Fig: 3: Closing Remarks by Er. Ganesh Shah



Fig: 4 Press Meet of HIC 2023



Fig: 5 Panel Discussion with the Advisors and AEPC member

Product Demonstration



Fig: 6 : Vishal Plastocab showcasing their products and Heritage Nepal showcasing their indoor, outdoor and pool lighting products



Fig: 7 Gorkha Eco Panel showcasing their products and Asian Paints showcasing their product



Fig: 8 Closing remarks by Er. Ganesh Shah



Fig: 9 Chief Guest, Advisors, Convenor and Participants



Fig: 10 Participants in the conclave



Fig: 11 Convener sharing Token of Love to Advisor Dr. Sunil Babu Shrestha

